LIGNISUL MSM (Methylsulfonylmethane)

A DOUBLE BLIND STUDY OF ITS USE IN DEGENERATIVE ARTHRITIS

(A Preliminary Correspondence)

Ву

Ronald M. Lawrence, M.D., Ph.D. Assistant Clinical Professor U.C.L.A. School of Medicine Los Angeles, California Methyl-Sulfonyl-Methane (M.S.M.) is an organic sulfur compound which is a metabolite of dimethyl-sulfoxide (D.M.S.O.). It is a white, odorless, slightly bitter tasting, crystalline substance, which contains 34 percent elemental sulfur. It is easily soluble in water. Its chemical formula is (CH3)2S02. It has been suggested by Lovelock and his associate's (1) that M.S.M. and its related compounds D.M.S.O. and D.M.S. (dimethyl-sulfide) provide 85 percent of the sulfur found in all living organisms.

The cycle of these naturally occurring sulfur compounds begins in the ocean where microscopic plankton release sulfur compounds called dimethyl sulfonium salts. These salts are transformed in the ocean into the very volatile compound D.M.S., which escapes from the water as a gas, that rises into the upper atmosphere. Exposed to ozone and high-energy ultraviolet light the D.M.S. is converted to D.M.S.O. and M.S.M. Both the D.M.S.O. and M.S.M. are very soluble in water and they return to the surface of the earth in rainwater. Plants then take up the two compounds into their root systems concentrating them up to one hundred fold. M.S.M. (sulfur) is incorporated into the plant structure. Through the process of plant metabolism the M.S.M., along with the other sulfur compounds it has spawned, are ultimately mineralized and transported back to the ocean and the sulfur cycle begins again.

M.S.M. is found naturally in the human body. It occurs in the blood and in other organs and has been detected in normal human urine (2). The level of M.S.M. in the circulatory system of an adult human male is about 0.2 parts per million (3). Normal human adults excrete from four to eleven milligrams M.S.M.

per day in their urine. Experiments using radiolabled sulfur (S35) in M.S.M. have shown that after ingestion the sulfur in M.S.M. helps form the essential amino acids methionine and cysteine (4).

M.S.M. is rated as one of the least toxic substances in biology, similar in toxicity to water (5). The lethal dose (LD50) of M.S.M. for mice is over 20 grams per kilogram of body weight. Hundreds of patients have been treated at the Oregon Health Sciences University (6) with oral M.S.M. at levels above two grams daily for many years without serious toxicity.

Since sulfur is found to be needed for the formation of connective tissue, M.S.M. has been studied for its use in treating arthritis of various types (7). Sulfur concentration in arthritic cartilage has been shown to be about one-third the level compared to normal cartilage (8). In addition, the amino acid cystine has been noted to be diminished in arthritic patients.

Personal communication with Stanley Jacob, M.D., Gerlinger Professor, Department of Surgery, Oregon Health Sciences University, Portland, Oregon, substantiated his personal experiences using M.S.M. in the treatment of patients with degenerative (osteoarthritis) arthritis.

Study Design

M.S.M. was provided in a crystalline form (LIGNISULmsm™) which we encapsulated in a clear gelatin capsule providing 750 mgms of LIGNISULmsm™

per capsule. The placebo substance, which was also placed in clear gelatin capsules, consisted of sugar (sucrose) to which a small amount of quinine sulfate was added to create a slightly bitter taste. This was done in case the capsule was opened and tasted, since M.S.M. also has a slightly bitter taste.

A total of sixteen patients were studied over a period of four months. Initially twelve patients were admitted to the study and subsequently (two months later) an additional four patients were added to the study group. The initial twelve patients were divided as follows. Eight were given the M.S.M., while four received the placebo. Later, the additional four patients were divided into two on M.S.M. and two on placebo. Totally, therefore, we had ten patients on M.S.M. and six patients on placebo.

Criteria for Selection

Patients ranged from age 55 to age 78. All patients had x-ray evidence of degenerative joint disease (degenerative arthritis). All patients had pain in the involved area ranging from four weeks to six months. Most of the patients had tried non-steroidal anti-inflammatory drugs or aspirin type compounds. None had taken steroids either orally or by injection. All non-steroidal anti-inflammatory drugs or other anti-arthritic medications or alternative health remedies were stopped at least three days prior to their entering the study.

Patients were randomly chosen by lot and assigned to either the active (M.S.M.) group or the placebo group. The treating physician did not have

knowledge as to which patient received which agent until after the completion of the study. Records were kept by an independent evaluator until the study was terminated. Both the patients and the physicians were blinded.

Of the eight patients of LIGNISULMSM*, two had osterarthrifis in their hands, three had lumbar degenerative joint disease, two had degenerative arthritis in their knees, and one had arthritis in the shoulder.

Of the six patients who received the placebo, two had degenerative arthritis in the knees, two had lumbar degenerative joint disease, one had degenerative arthritis in the hip, and one has osteoarthritis in the neck.

<u>Dosage</u>

Patients were instructed to take two capsules on an empty stomach in the A.M. after arising and one capsule before lunch. This constituted a 2250-milligram dose of LIGNISULmsm⁻⁻ daily and zero dose of M.S.M. on the placebo.

<u>Measurement</u>

Each patient was administered a visual analog scale (V.A.S.) which consisted of a 10-cm line anchored at one end by a label of "no pain" and at the other end a label of "pain as bad as could possibly be." The scoring is accomplished by having the patient mark the line indicating pain intensity, and the line is then measured to the mark on a 1-100 scale (9).

Results

The V.A.S. was completed by each patient at the four-week and at the six week visit. Records were measured by an independent evaluator.

At the four-week visit, the patients on the LIGNISULmsmm showed a 60 percent improvement on average, while at the six-week V.A.S. evaluation the patients showed an 82 percent improvement in pain on average.

Those on the placebo showed an improvement of 20 percent on average at four weeks and an 18 percent improvement on average at six weeks.

Abstract

This premliminary simple study was performed to initially evaluate 16 patients suffering from degenerative arthritis as to the effect of using LIGNISULMSMIN to control their pain. Eight patients, randomly chosen, were treated with 2250 mgms of M.S.M. per day. Six patients received placebo capsules. Results indicate a better than 80 percent control of pain within six weeks of beginning the study, while only two patients showed a minimal improvement (less than 20 percent) on the placebo. Although this was only a simple preliminary study, it appears that a more intensive investigation of M.S.M. is warranted. A larger group of arthritic patients and an additional measurement evaluation (such as range of motion, etc.) should be utilized in such a future

study. LIGNISULmsmm may offer a significant new nutritional substance for the control of arthritic pain as a safe, non-toxic method.

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For Release: IMMEDIATE

Contact:

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Cardinal Nutrition Announces First MSM Toxicity Study Ever Accepted for Publication by Pecr-Reviewed Scientific Journal

VANCOUVER, WA March 4, 2002 - Cardinal Nutrition, the world's largest licensed manufacturer and supplier of MSM (methylsulfonylmethane), announced publication of the first GLP-compliant (Good Laboratory Practices-compliant) toxicity study to be performed on any brand of MSM. The study was performed on Cardinal Nutrition's branded ingredient OptiMSMTM at a pharmaceutical toxicology laboratory and has been accepted for publication by The Journal of Food and Chemical Toxicology. This acute and subchronic toxicity study is the first MSM study ever to be accepted for publication in a peer-reviewed scientific journal.

"This considerable achievement is evidence of Cardinal Nutrition's continuing commitment to methodically advance the scientific support for MSM," said Michael D. Levin, vice president of business development.

Researchers at the Southern Research Institute in Birmingham, AL, and the Institute for Drug Research and Pharmaceutical Control and Development Laboratory in Budapest, Hungary, performed a two-part acute toxicity study. In the first part, 20 rats were given a single oral dose of 2 grams of OptiMSM per kilogram of body weight. This is equivalent to a single human dose exceeding 140 grams. No mortality was observed and no adverse effects or clinical signs of toxicity were observed in any of the rats or in any of their 36 organs and tissues that were examined.

The same researchers performed a 90-day subchronic oral toxicity study. They administered OptiMSMTM to 80 rats at a daily dose of 1,500 mg per kilogram of body weight. This is equivalent to more than 100 grams per day for a person weighing 150 pounds. (Recommended intake of MSM in humans is 2 to 10 grams per day.) Toxicity was not expected based on the results of previous acute oral toxicity studies. No deaths occurred during the study. No toxic symptoms occurred. No adverse changes in general state, appearance, or behavior were observed. No adverse effects were observed on blood tests or urinalysis. Both studies were conducted in compliance with the principles of the Good Laboratory Practice Regulations for Nonclinical Laboratory Studies of the United States Food and Drug Administration.

"The acceptance of this study for publication in a peer-reviewed journal validates the results of the previous toxicity studies we have sponsored," stated Jeremy Appleton, ND, director of scientific affairs at Cardinal. "The study results confirm the superior safety profile of OptiMSMTM, even at extremely high intakes. Knowing that OptiMSM is safe for daily consumption is likely to strengthen consumer confidence. We are very pleased."

Cardinal Nutrition's MSM experts have established themselves as industry leaders by setting new standards for product purity, testing and research. Their branded ingredient, U.S.-made OptiMSMTM, is always distilled for purity, and every batch is subject to rigorous third party testing. Cardinal Nutrition operates the world's only facility dedicated to the sole production of licensed MSM. It is also the only

http://www.cardinalnutrition.com/pr_toxipub.html

The Surgeon General's Report on NUTRITION AND HEALTH

Press Release: Cardinal Nutrition Announces Toxicity Study Accepted for Publication

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MSM production facility that is both kosher and NNFA GMP certified. Cardinal Nutrition is committed to advancing science to optimize health. For more information on Cardinal Nutrition or OptiMSM call 1-888-SEEK-MSM (888-733-5676).

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DEPARTMENT OF HEALTH & HUMAN SERVICES

The Surgeon General of the Public Health Service Washington DC 20201

MESSAGE FROM THE SURGEON GENERAL

I am pleased to transmit to the Secretary of the Department of Health and Human Services this first Surgeon General's Report on Nutrition and Health. It was prepared under the auspices of the Department's Nutrition Policy Board, and its main conclusion is that overconsumption of certain dietary components is now a major concern for Americans. While many food factors are involved, chief among them is the disproportionate consumption of foods high in fats, often at the expense of foods high in complex carbohydrates and fiber-such as vegetables, fruits, and whole grain products—that may be more conducive to health.

I offer this Report in the context of the obligation of the Surgeon General to inform the American public of developments in the science base that have widespread implications for human health. Perhaps the classic example of such reports is the one issued in 1964 during the tenure of one of my predecessors, Dr. Luther Terry, which summarized the epidemiologic evidence available at the time on the relationship of tobacco to health. This report called attention to the inescapable conclusion that eigarettes were a major source of illness and death for those who smoked-at that time a majority of adult men.

This Surgeon General's Report on Nutrition and Health follows the tradition of the original report on smoking and health. It addresses an area of some controversy and substantial misunderstanding. And the relative magnitude of the associated health concerns is comparable, with dietary factors playing a prominent role in five of the ten leading causes of death for Americans. In addition, the depth of the science base underlying its findings is even more impressive than that for tobacco and health in 1964, with animal and clinical evidence adding to the epidemiologic studies.

On the other hand there are some fundamental differences. Most obvious is the fact that food is necessary for good health. Roods contain nutrients essential for normal metabolic function, and when problems arises they result from mainful interaction with content factors. Moreover, we know today much more about individual variation in response to nutrients than we know about possible variations in

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response to tobacco. Some people are clearly more susceptible than others to problems from diets that are, for example, higher in fat or salt.

Also, unlike the experience for tobacco in 1964, people are already making dietary changes, as witnessed by the shift to products lower in saturated fats. Nonetheless, the important effects of the dietary factors underlying problems like coronary heart disease, high blood pressure, stroke, some types of cancer, diabetes, obesity-problems that represent the leading health threats for Americans-indicate the potential for substantial gains to be accrued by the recommendations contained in this Report

It is important to emphasize that the focus of this Report is primarily on the relationship of diet to the occurrence of chronic diseases. The Report is not intended to address the problems of hunger or undernutrition that may occur in the United States among certain subgroups of the population. All Americans should have access to an appropriate diet, but they do not. And even though the size and numbers of problems related to inadequate access to food are proportionately much smaller than those related to dietary excesses and imbalances, the problems of access to food are of considerable concern to me, personally, wherever they may occur.

The apparently sizable numbers of people resorting to the use of soup kitchens and related food facilities, as well as the possible role of poor diet as a contributor to the higher infant mortality rates associated with inadequate income, suggest the need for better monitoring of the nature and extent of the problem and for sustained efforts to correct the underlying causes of diminished health due to inadequate or inappropriate diets.

This report was prepared primarily for nutritional policy makers, although the eventual beneficiaries of better nutritional policy will be the American people. I am convinced that with a concerted effort on the part of policy makers throughout the Nation, and eventually by the public, our daily diets can bring a substantial measure of better health to all Americans. I commend to them the recommendations of this Report.

C. Everett Koop, M.D., Sc.D.

Surgeon General

U.S. Public Health Service



Summary and Recommendations

This Report addresses the substantial impact of daily dietary patterns on the health of Americans. Good health does not always come easily. It is the product of complex interactions among environmental, behavioral, social, and genetic factors. Some of these are, for practical purposes, beyond personal control. But there are many ways in which each of us can influence our chances for good health through the daily choices we make.

In recent years, scientific investigations have produced abundant information on the ways personal behavior affects health. This information can help us decide whether to smoke, when and how much to drink, how far to walk or climb stairs, whether to wear seat belts, and how or whether to engage in any other activity that might alter the risk of incurring disease or disability. For the two jour of three adult Americans who not smoke and do not drink excessively one personal choice seems to influence long term a health prospects more than any other, what we eat.

Food sustains us. it can be a source of considerable pleasure, it is a reflection of our rich social fabric and cultural heritage, it adds valued dimensions to our lives. Yet what we eat may affect our risk for several of the leading causes of death for Americans, notably, coronary heart disease, stroke, atherosclerosis, diabetes, and some types of cancer. These disorders together now account for more than two-thirds of all deaths in the United States.

Undernutrition remains a problem in several parts of the world, as well as for certain Americans. But for most of us the more likely problem has become one of overeating—too many calories for our activity levels and an imbalance in the nutrients consumed along with them. Although much is still uncertain about how dietary patterns protect or injure human health, enough has been learned about the overall health impact of the dietary patterns now prevalent in our society to recommend significant changes in those patterns.

This first Surgeon General's Report on Nutrition and Health offers comprehensive documentation of the scientific basis for the recommended dietary changes. Through the extensive review contained in its chapters, the Report examines in detail current knowledge about the relationships among specific dietary practices and specific disease conditions and sum-

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Nutrition and Health

marizes the implications of this information for individual food choices, public health policy initiatives, and further research. The Report's main conclusion is that overconsumption of certain dietary components is now a major concern for Americans. While many food factors are involved, chief among them is the disproportionate consumption of foods high in fats, often at the expense of foods high in complex carbohydrates and fiber that may be more conducive to health. A list of the key recommendations based on the evidence presented in the Report is provided in Table 1.

Magnitude of the Problem

Diet has always had a vital influence on health. Until as recently as the 1940's, diseases such as rickets, pellagra, scurvy, beriberi, xerophthalmia, and goiter (caused by lack of adequate dietary vitamin D, niacin, vitamin C. thiamin, vitamin A, and iodine, respectively) were prevalent in this country and throughout the world. Today, thanks to an abundant food supply, fortification of some foods with critical trace nutrients, and better methods for determining and improving the nutrient content of foods, such "deficiency" diseases have been virtually eliminated in developed countries. For example, the introduction of iodized salt in the 1920's contributed greatly to eliminating iodine-deficiency goiter as a public health problem in the United States. Similarly, pellagra disappeared subsequent to the discovery of the dietary causes of this disease. Nutrient deficiencies are reported rarely in the United States, and the few cases of protein-energy malnutrition that are listed annually as causes of death generally occur as a secondary result of severe illness or injury, child neglect, the problems of the house-bound aged, premature birth, alcoholism, or some combination of these factors.

As the diseases of nutritional deficiency have diminished, they have been replaced by diseases of dietary excess and imbalance—problems that now rank among the leading causes of illness and death in the United States, touch the lives of most Americans, and generate substantial health care costs. Table 2, for example, lists the 10 leading causes of death in the United States in 1987.

In addition to the five of these causes that scientific studies have associated with diet (coronary heart disease, some types of cancer, stroke, diabetes mellitus, and atherosclerosis), another three—cirrhosis of the liver, accidents, and suicides—have been associated with excessive alcohol intake.

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The Miracle of Wheatgrass

When desperate patients and family members call our office hoping for miracles we always tell them we are out of magic bullets. Just as the development of cancer is a complicated process, so too, complete and permanent recovery from cancer requires a slow repair process in which careful attention must be paid to multiple aspects of body chemistry.

One gift of nature - chlorophyll - more closely approximates a miracle food than any other we've encountered,

Wheat grass juice is an excellent source of chlorophyll. Wheat grass juice is also high in iron, oxygen, and enzymes and is one of the richest sources of vitamins A, B, and C.

Studies of wheatgrass by Dr. Chiu Nan Lai of the University of Texas System Cancer Center showed it to be a **potent inhibitor of several carcinogens**. Applying low levels of the extract to mutagens diminished activity in them by up to 99%.

More research has examined the healing properties of chlorophyll in general and seems to be related to the fact that the chlorophyll molecule is nearly identical to that of hemoglobin, whose single atom of iron replaces one atom of magnesium.

Distinguished medical specialists have reported hundreds of cases in which chlorophyll has cured deep infections, stimulated healing, removed necrotic debris from open wounds, and accelerated connective tissue and epidermal proliferation.

Many reports of chlorophyll's effectiveness have come through Dr. Ann Wigmore, ND, and teacher of natural living. Dr. Ann credits wheatgrass with curing her gangrenous leg and preventing its amputation. She subsequently founded the Hippocrates Health Institute in Boston to teach others about wheatgrass.

According to Dr. Ann, Dr. Bernard Jensen and G. P. Earp-Thomas of Bloomfield Laboratories, chlorophyll purifies the blood, prevents tooth decay, aids in proper digestion, helps detoxify the liver, keeps the thyroid gland in balance, cleanses internal organs, enhances capillary function, supports sex hormones, decontaminates inorganic chemicals, and builds up white blood cell counts.

Furthermore, green juices provide easy assimilation of nutrients especially in cases of poor digestion or immuno-suppression. Reports of chlorophyll's effectiveness in managing human ailments abound.

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Recent medical research has found that cancer goes into remission when the body is alkaline. The raw living foods diet helps to make the body alkaline (easily tested with litmus paper), but our personal experiences since 1976 support the research of Dr. Wigmore —

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"The alarming fact is that foods (fruits, vegetables and grains) now being raised on millions of acres of land that no longer contains enough of certain minerals, are starving us – no matter how much we eat. No man of today can eat enough fruits and vegetables to supply his system with the minerals he requires for perfect health because his stomach isn't big enough to hold them."

"The truth is that our foods vary enormously in value, and some of them aren't worth eating as food ... Our physical well-being is more directly dependent upon the minerals we take into our system than upon calories or vitamins or upon the precise proportions of starch, protein or carbohydrates we consume."

U.S. Senate Document No. 264 (1936).

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"IN THE MOOD FOR SOME GRAPEFRUIT RINDS?

"A few years ago a researcher at the University of Florida got a lot of publicity when he found that pectin derived from grapefruit rinds had a powerful cholesterol-lowering effect. Of course, not too many people started eating grapefruit rinds!

"Dr James Cerda continued his research and found some truly amazing results with the swine he used as experimental animals because their hearts and blood vessels are so similar to ours. When they were fed a high-fat diet, those pigs developed severe atherosclerosis. The research included directly examining the insides of the pigs' aortas and arteries after they were slaughtered, which would be impossible to do with humans. Not many humans will volunteer for that!

"Then they conducted what could eventually be a milestone research project. Dr Cerda and his associates fed the artery-clogged swine a diet supplemented with either grapefruit pectin or cellulose as the placebo. You'll recall that cellulose does not have the heart-protecting qualities of other fibers. The results were nothing short of amazing.

"After consuming the fiber for 270 days, pigs getting pectin had coronary arteries with 24 percent blockages, while those getting the cellulose had 45 percent clogging. All the pigs had been eating a very high-fat diet all along, and their cholesterol levels had soared. Looking at the pigs' aortas, the main vessel leaving the heart, Dr Cerda found one-third the blockage in those getting pectin as compared with the placebo group.

"Does pectin, and perhaps other soluble fibers as well, retard the development of atherosclerosis or maybe even reverse it in humans as well as swine? On the pessimistic side, this was an animal trial, and no similar studies have been done with humans. Optimistically, however, the pigs' cardiovascular system is remarkably similar to ours, and swine have been used for decades to predict what dietary influences might mean for us. Most typically, findings in swine have turned out to be similar in human studies."

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Atherosclerosis...in the most recent study to date nearly 62 million Americans have some form of cardiovascular disease, and nearly a million die from it each year (American Heart Association, 12/2001, annual statistics). It is the leading cause of death in the US followed by cancer and strokes.

It is caused by oxidized cholesterol, basically your bad type of cholesterol - LDL - which has turned rancid in your bloodstream and forms into a sticky substance that adheres to the walls of your arteries and hardens. Even the explanation sounds awfull

It gets worse. After a few years, the plaque gets thick and starts to flake off into your bloodstream. If a larger chunk of this plaque travels through your bloodstream and gets lodged into a smaller artery that leads to your heart, you have a myocardial infarction, or heart attack.

If the chunk of plaque makes it to your brain first, you have a stroke. (this is somewhat simplified but 83% of all strokes are considered ischemic strokes, i.e. when a blood clot blocks the flow of oxygenated blood to a portion of the brain.)

There is good news. I have found a substance that works like liquid plumber on your arteries, cleaning them without the side effects associated with prescription medicine. It is very inexpensive, can be purchased at almost any health food store and has research to validate the claims. It's scientific name...grapefruit pectin.

Pectin is the stringy part of the grapefruit, it stops the bad LDL cholesterol from turning rancid in your bloodstream. The most interesting research, and there has been much, involved pigs who were fed a diet hopefully none of us will ever be submitted to...15% pure lard!

The group of pigs was split into two groups, both eating the same diet with one exception, one group also ate some pectin. The study lasted 12 months, At the end of the study, the group of pigs that had eaten pectin had 85% LESS plaque lining the arteries around their hearts and an 88% decrease in the narrowing of the small coronary arteries that supply the blood to the heart. Bottom line, even with a diet high in fat, grapefruit pectin was able to prevent atherosclerosis. (Clinical Cardiology 88;11:595-600.)

Animal studies are important because at the end of the study you can open the subject up and examine the results closely. Animal studies do not always transfer to human studies. With grapefruit pectin, however, the results were transferable.

In one study with 27 patients age 27 to 69 with total cholesterol reading ranging from 208 to 420mg/dl, patients who were supplemented with 15gm of grapefruit pectin per day decreased their LDL (bad cholesterol) on average from 195 mg/dl at the beginning to 174mg/dl at the end, HDL (good cholesterol) was unchanged. This resulted with no change whatsoever in their diet or lifestyle. (Circulation 94;89[3]1247-1253)((Clinical Cardiology 88;11:589-591)(J Franklin Institute 94; (331A):199-202)

It gets even better. Pectin doesn't just protect your arteries from further damage, it can actually dissolve existing plaque. What this means is that as your arteries become cleaner and cleaner circulation of blood to every organ in your body could increase to levels of a teenager. (There are dozens of medical disorders that can be attributed to poor circulation)

Finally, pectin has been shown to be as effective as anticholesterol drugs including Cholybar, Questran and Questran light (Clinical Cardiology 88;11:595-600). These prescription drugs have been associated with increases in night blindness, osteoporosis, unusual bleeding and bruising. They can also result in serious complications if taken with other drugs including blood thinners, thyroid hormones, and diabetes and heart medications.

There have been no side effects associated with taking grapefruit pectin. Grapefruit Pectin provides us a simple, inexpensive substance with no side effects that can prevent and even reverse the most deadly killer in the US today...heart disease and strokes.

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Gregory Young

Source: Healthy & Natural Journal, Feb98, Vol. 5 Issue 20, p131, 2p

Item: 6086637

The body prefers the slightly alkaline solution of 7.4, and if it drops below this for any length of time, it will suffer from a score of degenerative diseases. The lower limit of blood pH at which a person can live more than a few hours is about 6.8, and the upper limit is about 8.0.

As more and more acid is accumulated, and storage capacity is exhausted, the body slowly begins to "stew" in its own acid poisonous wastes. Without warning, acid wastes begin to silently corrode the veins and arteries, destroying cell walls and then entire organs. The damage caused is compounded daily, becoming more aggressive and deadly over time.

By Michael Rahman

Source: Alive: Canadian Journal of Health & Nutrition, Apr97 Issue

174, p44, 2p Item: 5972530

By monitoring the subtle yet powerful values of pH (acidity or alkalinity), oxidation reduction or redox (the electron potential and enzyme activity), and resistivity (molecular ion movement) of these fluids, and by making changes at a biochemical level, health and vitality can be re-established to help combat illness and disease

For the body, the "terrain" that allows for the development of cancer is over-acidity, oxidative stress and the lack of proper elimination or detoxification. Oxidative stress simply refers to cellular breakdown or degeneration. The antioxidant vitamins, such as vitamins A, B, C and E, are important in reducing this oxidative stress.

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The "soils" which support the development of cancer are also acidic. This acidity may arise from the "dis-ordered" cellular work, which is a hallmark of cancer. Both in the treatment and the prevention of cancer development, the terrain must become less acidic — or more alkaline.

This is best done through modification of the diet to a more vegetarian or vegan orientation. Animal products, including dairy products, are highly acid-forming foods. One may also reduce the amount of acids in the body through supplementation of the alkaline-forming minerals magnesium and potassium, when indicated.

By Sophia Jesswein

Source: Alive: Canadian Journal of Health & Nutrition, Mar95 Issue 150, p27, 2p

Even Canada's new food guide (the rainbow) points to a more vegetarian style of eating and a more alkaline diet, recommending five to 10 servings of fresh fruits and vegetables a day, as well as plenty of whole grains, which translates to about 70 per cent of your daily food intake. That's a lot of greens, fruits, vegetables and grains in our fast paced world.

MSM

By Ronald M. Lawrence, M.D., Ph.D.

Source: Total Health, Mar/Apr2001, Vol. 23 Issue 2, p40, 2p

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Researchers at Oregon Health Sciences University studied a strain of mice that were prone to the spontaneous development of joint lesions similar to those in rheumatoid arthritis. They found that animals that were fed a diet that included a three percent solution of **MSM** as drinking water, from two months to five months of age, suffered no degeneration of articular cartilage. In a control group of mice receiving only tap water, 50 percent of the animals were found to have a focal degeneration of articular cartilage.

By Stanley W. Jacob

Source: Alive: Canadian Journal of Health & Nutrition, Nov2000 Issue 217, p96, 2p

As a surgeon and medical researcher at the Oregon Health Sciences University in Portland, Oregon, I have found **MSM** to be a truly amazing compound. I've used it successfully in treating a wide variety of patients suffering from simple arthritis and joint pain to more chronic conditions including irritable bowel syndrome. I have been able to provide relief in about 70 per cent of patients with chronic autoimmune disorders such as lupus, scleroderma, fibromyalgia and rheumatoid arthritis with aggressive **MSM** therapy. When treating patients at my hospital-based clinic, I often begin with a course of IV therapy, followed by large doses of oral and topical **MSM**. I've also found it to be useful in the treatment of food and pollen allergies, which is the subject of current ongoing clinical trials.

By Ronald M. Lawrence, M.D., Ph.D.

Total Health Mar/Apr2000, Vol. 22 Issue 2, p40, 2p, 1c

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As a physician and founding member of the International Association for the Study of Pain, I have long been interested in natural products that can relieve pain without the side effects of prescription drugs, which can be severe. Over the last several years, I have experimented with *MSM* (methyl-sulfonyl-methane), a nutritional supplement derived from natural organic sulfur, and found it to have tremendous pain-relieving benefits for a variety of ailments

The recent popularity of **MSM** prompted me to conduct a clinical study to validate the anecdotal claims made by athletes who use the nutritional supplement to relieve sports injuries. My study centered around Lignisul **MSM**, a brandname **MSM** compound produced by Carolwood Corporation to meet the most stringent quality guidelines.

The results were impressive. Of the 24 patients involved in the study, those taking Lignisul *MSM* had a significant level of recovery (58.3 percent) compared to those on placebo (33.3 percent). In addition, patients on Lignisul *MSM* had 40 percent fewer office visits before recovery.

The study was conducted in the clinical practice of Drs. Daniel Sanchez and Mark Grosman. The doctors treat a large number of athletic injuries each day. Each of the patients involved in the study suffered from acute injuries sustained during athletic activity. Each was treated with similar therapy and each received unmarked capsules of either a placebo or Lignisul MSM. Four of the patients taking the MSM reported the disappearance of symptoms after taking the capsules for a very short period of time.

The study reinforced the findings of previous studies, which have shown that **MSM** has a very low level of toxicity and has few, if any, side effects for the user. In addition to the positive health factors, the economic advantages of **MSM** illustrated by this study can't be ignored. The compound itself is inexpensive and easy to use. In addition, the 40 percent reduction in office visits for those on **MSM** versus the placebo make it an invaluable, cost-effective treatment for sports injuries.

Based on this study, I believe that **MSM** should be considered an invaluable addition for the treatment of short-term athletic injuries of

the type that were involved in the study. From an economic point of view, we were particularly gratified to see a marked reduction in the number of office visits usually required to treat these injuries.

Excerpted from The Miracle of **MSM**: The Natural Solution for Pain by Dr. Stanley Jacob, Dr. Ronald M Lawrence and Martin Zucker.

Editor's Note: Ronald M. Lawrence, M.D., Ph.D., is executive director of the Council on Natural Nutrition and medical director of Carolwood Corporation. Throughout his career he has authored numerous scientific papers on pain, nutrition, neurophysiology and sports medicine. He is the author of the book, Goodbye Pain.

GRAPEFRUIT PECTIN

By Jean Carper

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Source: Natural Way for Better Health, Mar/Apr95, Vol. 1 Issue 1, p64, 1p

AMAZING PECTIN

Grapefruit contains a special type of fiber that does more than lower cholesterol. The **pectin** in **grapefruit** may actually help reverse heart disease by sweeping away some of the plaque in arteries that cause clogging, heart attacks and strokes.

So finds James J. Cerda, M.D., of the University of Florida. In a new study, he first gave pigs a very high-fat diet for more than a year to induce plaque-damaged arteries or atherosclerosis. Then he fed half of the pigs *grapefruit pectin* for about nine months; the others got a different type of fiber.

When Dr. Cerda examined the pigs' arteries, the difference was incredible. Pigs getting the *grapefruit pectin* had only 40 percent as much damage to their aortas, the heart's main artery, and half as much narrowing of the arteries. The exciting fact is *grapefruit pectin*

seemed to help clear out arteries that were already badly clogged and damaged.

Source: Wellness Newsletter, Mar/Apr92, Vol. 13 Issue 2, p4, 1p

CITRUS PECTIN PREVENTS CHOLESTEROL BUILD-UP

1.2.76

Heard of the sticky substance in fruit that's used to make jelly? University of Florida researchers report new evidence that eating citrus *pectin* (the sticky stuff), will help keep arteries clear of cholesterol plaque.

Drs. Sigurd Normann and James Cerda, both with the University of Florida's College of Medicine, say their studies in swine (no kidding) reveal that adding *grapefruit pectin* to the daily diet (the equivalent of one fresh *grapefruit* daily) may result in actual regression of atherosclerosis — a leading cause of heart attack and stroke. The researchers conducted the study in pigs because their blood vessels are similar to those of humans, as is their susceptibility to atherosclerosis.

"We demonstrated that *grapefruit pectin* will, (even) in the face of a high-fat diet, significantly retard atherosclerosis by promoting regression of cholesterol deposits and by interfering with the build-up of fatty plaque," said Cerda, professor of gastroenterology and nutrition.

Cerda emphasizes, "We would not recommend that people stay on a high-fat diet like our research animals did, and it is important to note citrus juice will not have the same beneficial effects as fresh grapefruit or oranges. Pectin is found in the rind and in the sections of the fruit, not in the juice."

The UF scientists found that dietary *pectin* had a beneficial effect lowering blood levels of both cholesterol and low density lipoproteins (LDL), which some scientists believe is a harmful fraction of cholesterol. Adding *pectin* to the diet had no apparent effect on blood levels of high density lipoproteins (HDL), which many scientists believe is a beneficial cholesterol- transporting molecule.

NUTRIENTS IN SOIL

12.20.203

By R.L. Wysong, B.S., D.V.M.

Source: Total Health, Jul/Aug2001, Vol. 23 Issue 4, p62, 1p

 A one-acre planting of tomatoes yielding one ton removes eight hundred pounds of the soil's mineral nutrients. Twenty-three elements are essential to human health and are being taken out of the soil. Fertilization with "NPK" (nitrogen, phosphorus and potassium) does not replace what is lost (16 elements are declared essential for crop growth according to the Soil Science Society of America). NPK also displaces absorption of other minerals and produces toxic nitrate.

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Meridian Institute News

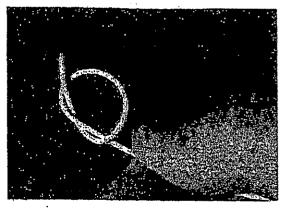
RESEARCHING THE SPIRIT-MIND-BODY CONNECTION

In this issue:

- pH-Dependent Viruses
- Mysterious Cancer Serum
- Calendar

pH-Dependent Viruses

For over five years researchers at Meridian Institute have been looking into the connection between pH (acid/alkaline) balance and viral infection – a link noted by Edgar Cayce in several of his psychic readings. With the recent epidemic of severe acute respiratory syndrome (SARS) and continued concerns about common conditions such as colds and flu, our interest in this field has expanded to explore basic science and clinical projects to test the Cayce hypothesis. Here is an overview of what we have found so far and where we are headed. Some simple preventive measures will also be discussed.



Flexible microelectrode used for measuring nasal mucosa pH.

Understanding Viruses

Viruses are extremely small parasitic life forms, the smallest living things on Earth. In essence, a virus is a minuscule pocket of protein that contains genetic material.

Although viruses can remain dormant outside a living body, they only become active when in contact with live tissue. Once a virus infects a cell by penetrating the cell membrane, it can either lay dormant (lysogenic infection) or begin reproducing itself (lytic infection – the more common pattern). When a cell becomes full of virus, it bursts releasing the virus to infect other host cells.

A wide variety of diseases are caused by viruses including the common cold, flu, warts, measles, hepatitis, herpes, smallpox, and AIDS. SARS is just the latest in a long list of viral parasites.

Unlike bacteria that can usually be effectively treated with antibiotics, viral infections are often unresponsive to modern medical treatment. If the virus causing a disease has been discovered, a serum may be developed to provide inoculation against that specific virus. The most common approach to virus protection is to avoid contamination by infected individuals.

Viral pH Dependency

Laboratory experiments (in vitro) have confirmed that many viruses require a mildly acidic

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environment to attack host cells. At Meridian Institute we are interested in determining exactly how this physiological fact manifests within the human body (in vivo). Understanding the role of pH balance in viral infections may provide preventive and therapeutic breakthroughs for dealing with epidemics including the recent outbreak of SARS.

To appreciate the relevance of pH for viral infection, let's first review some facts about acid/alkaline balance. The acid/alkaline continuum ranges from 0-14 with 7 as neutral. The lower end of the scale (below 7) is acid and above 7 is alkaline.

Acid/alkaline balance is extremely important to normal physiology. For example, the blood will maintain a slightly alkaline range of 7.35 to 7.45. Extended pH imbalances of any kind are not well tolerated by the body. The management of the pH factor is so important that the body's primary regulatory systems (especially breathing, circulation, and eliminations) closely regulate acid-alkaline balance in every cell and system.

Certain viruses (including the rhinoviruses and coronaviruses that are most often responsible for the common cold and influenza viruses that produce flu) infect host cells by fusion with cellular membranes at low pH. Thus they are classified as "pH-dependent viruses."

Drugs that increase intracellular pH (alkalinity within the cell) have been shown to decrease infectivity of pH-dependent viruses. Since such drugs can provoke negative side effects, the obvious question is whether more natural techniques can produce the same result.

Possible Relevance to SARS

The World Health Organization has concluded that SARS is produced by a new virulent strain of coronavirus. Specific research on the possible pH dependency of the SARS virus has not yet been done. It is well known that coronavirus infectivity is exquisitely sensitive to pH. For example, the MHV-A59 strain of coronavirus is quite stable at pH 6.0 (acidic) but becomes rapidly and irreversibly inactivated by brief treatment at pH 8.0 (alkaline). Human coronavirus strain 229E is maximally infective at pH 6.0. Infection of cells by murine coronavirus A59 at pH 6.0 (acidic) rather than pH 7.0 (neutral) yields a tenfold increase in the infectivity of the virus.

If the strain of coronavirus responsible for SARS shares the pH characteristics of these other coronaviruses that are pH-dependent, this could be a valuable clue to effective prevention and treatment strategies for this frightening epidemic. Perhaps keeping a balanced or slightly alkaline pH environment for the body's tissues can provide viral protection or enhanced healing for SARS and common viral agents that cause respiratory infections.

Edgar Cayce's Recommendations

Edgar Cayce affirmed the importance of pH balance with regard to common viruses that cause colds and flu. Cayce repeatedly insisted that such infectious agents do not thrive in an alkaline environment. When asked how to prevent colds, Cayce replied, "by keeping the body alkaline. Only in acids do colds attack the body." (3248-1)

Cayce recommended using litmus paper to test the pH of urine and saliva as an indication of the pH balance of the body. We now have more precise means for monitoring pH in the form of pH paper and digital pH meters.

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As a practical preventive measure, Cayce's suggestions for alkalizing the body emphasized eating an abundance of fresh fruits and vegetables, especially salads: "... if an alkalinity is maintained in the system — especially with lettuce, carrots and celery, these in the blood supply will maintain such a condition as to immunize a person." (480-19) Consuming citrus fruit and juices was also a common alkalizing suggestion in the readings that addressed concerns about cold and flu infections.

Meridian Institute Research

We reported a preliminary study on dietary effects of urine pH in January 1999 (Vol 3 No 1). The study was done to test Edgar Cayce's recommendations for testing urine as a marker for systemic pH balance. Our conclusion was that following Cayce dietary recommendations of cating primarily alkaline-producing foods (such as fruits and vegetables) does indeed tend to alkalize the urine.

We have contacted leading researchers in the field of rhinovirus infection studies to make them aware of the possible role of acid/alkaline balance and seek feedback on how to do scientific studies to test the Cayce hypothesis in vivo – with human subjects. If it turns out that SARS is produced by a pH-dependent coronavirus, we will certainly make sure that the clinical researchers who do in vivo studies of viral infections are made aware of this potentially important factor.

Rhinovirus infection studies are done at several leading universities, usually to test the effectiveness of drugs that may help to prevent or relieve the symptoms of colds. Small amounts of solution containing rhinovirus are dropped into the noses of subjects to intentionally infect them under controlled conditions. Interestingly, about five to fifteen percent of subjects do not get colds even when the virus is carefully placed onto the nasal mucosa. Could it be that the pH of the resistant subject's nasal mucosa is alkaline (or neutral), preventing the rhinovirus from infecting the cells inside of the nose?

There have been several published studies on nasal mucosal pH with varying results. Some researchers have concluded that the pH of nasal secretions vary with sleep, rest, ingestion of food, emotional states, and menstrual cycles. Other scientists, using different technology, have failed to confirm these results. Clearly much work needs to be done in this area to establish consistent outcomes.

We have tested equipment from two of the leading companies that sell devices that can measure nasal pH and have learned that there is significant variability in the instruments, apart from the complexities of measuring pH in different people and within the same person over time.

The picture on page 1 shows a pH sensitive microelectrode that we are currently using to measure nasal mucosa pH. The device was developed for insertion through the nose and down into the esophagus in acid reflux patients. Since the system is already FDA approved for measuring pH in humans by insertion via the nasal cavity, it is ideally suited for our purposes. This particular model seems to be more sensitive and accurate than one we tested from another leading supplier of this type of instrument.

So far we have done a series of nasal mucosa pH measurements on two individuals. One of the notable outcomes from our preliminary efforts in this area is that psychological stress can have profound effects on nasal mucosa pH, causing a major drop (acidification) in pH. We will be doing more work with nasal mucosal pH with additional subjects to determine the possible relevance of this measure with regard to upper respiratory viral infection. We are also hoping to be able to do a collaborative study with established researchers who regularly conduct in vivo studies involving intentional infection with rhinovirus (the "common cold") to explore the possible connection between life-style factors (such as diet) and the infectivity of pH-dependent viruses.

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The Prime Cause and Prevention of Cancer (Revised Lindau Lecture) By OTTO WARBURG

(Director, Max Planck Institute for Cell Physiology, Berlin-Dahlem, Germany) English Edition by DEAN BURK*).

National Cancer Institute, Bethesda, Maryland*)

Note by DEAN BURK: Adapted from a lecture originally delivered by O. Warburg at the 1966 annual meeting of Nobelists at Lindau, Germany. O. Warburg won the Nobel Prize in Medicine in 1931 for his discovery of the oxygen-transferring enzyme of cell respiration, and was voted a second Nobel Prize in 1944 for his discovery of the active groups of the hydrogen transferring enzymes. Many universities, like Harvard, Oxford, Heidelberg has offered him honorary degrees. He is a Foreign member of the Royal Society if London, a Knight of the Order of Merit founded by Frederick the Great, and was awarded the Great Cross with Star and Shoulder ribbon of the Bundesrepublik. His main interests are Chemistry and

Physics of Life. In both fields no scientists has been more successful.

There are prime and secondary causes of diseases. For example, the prime cause of the plaque is the plaque bacillus, but secondary causes of the plaque are filth, rats, and the fleas that transfer the plaque bacillus from rats to man. By a prime cause of a disease I mean one that is found in every case of the disease.

Cancer, above all other diseases, has countless secondary causes. But, even for cancer, there is only one prime cause. Summarized in a few words, the prime cause of cancer is the replacement of the respiration of oxygen in normal body cells by a fermentation of sugar. All normal body cells meet their energy needs by respiration of oxygen, whereas cancer cells meet their energy needs in great part by fermentation. All normal body cells are thus obligate aerobes, whereas all cancer cells are partial anaerobes. From the standpoint of the physics and chemistry of life this difference between normal and cancer cells is so great that one can scarcely picture a greater difference. Oxygen gas, the donor of energy in plants and animals is dethroned in the cancer cells and replaced by an energy yielding reaction of the lowest living forms, namely, a fermentation of glucose.

The key to the cancer problem is accordingly the energetics of life, which has been the field of work of the Dahlem institute since its initiation by the Rockefeller Foundation about 1930. In Dahlem the oxygen transferring and hydrogen transferring enzymes were discovered and chemically isolated. In Dahlem the fermentation of cancer cells was discovered decades ago; but only in recent years has is been demonstrated that cancer cells can actually grow in the body almost with only the energy of fermentation. Only today can one submit, with respect to cancer, all the experiments demanded by PASTEUR and KOCH as proof of the prime causes of a disease. If it is true that the replacement of oxygen-respiration by fermentation is the prime cause of cancer, then all cancer cells without exception must ferment, and no normal growing cell ought to exist that ferments in the body.

An especially simple and convincing experiment performed by the Americans MALMGREN and FLANEGAN confirms the view. If one injects tetanus spores, which can germinate only at very low oxygen pressures, into the blood of healthy mice, the mice do not sicken with tetanus, because the spores find no place in the normal body where the oxygen pressure is sufficiently low. Likewise, pregnant mice do not sicken when injected with the tetanus spores, because also in the growing embryo

http://www.stopcancer.com/ottolecture3.htm